

REMARKS

Reconsideration and allowance of the present application based on the following remarks are respectfully requested. By this Amendment, claims 1, 4, 6, 7, 10, 18, 21, 24, 29 and 33 are amended and claims 14 and 16-17 are cancelled without prejudice or disclaimer. Support for the amendments can be found at least in the Fig. 1 and from page 12, line 17 to page 13, line 12 of the specification.

The drawings were objected to allegedly because Fig. 3A did not provide a key or otherwise indicate what the squares and diamonds represent. However, Fig. 3A is a characteristic diagram of phase grating depth and diffraction efficiency to help explain the principle of the present invention (page 9, lines 13-15 of the specification). Therefore, it is not required for Fig. 3A to provide a key or to indicate what the squares and diamonds represent. Thus the objection should be respectfully withdrawn.

Claims 1, 7, 10, 16, 18 and 27-28 (and claims 2-5, 8-9, 11-13, 15, 19-20 and 29-32 that depend from them) were objected to as having informalities. By this Amendment, claims 1, 7, 10 and 18 have been amended and claim 16 has been canceled. Amended claims 1, 7, 10 and 18 do not have informalities. Claims 27-28 are not amended and do not have informalities because it is not necessary to positively claim the light-receiving element because it is not part of the invention. Thus the objections should be respectfully withdrawn.

Claim 23 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. However, the limitation of "if the distance between the center of said hologram and the optical axis of said first light source is $\delta 1$ and the distance between the center of said hologram and the optical axis of said second light source is $\delta 2$ in a projection plane in the direction of the optical axis of said objective lens, the expression $\delta 1 < \delta 2$ is almost satisfied" in claim 23 does not necessarily contradict the limitation of "the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram" in claim 21. Thus, claim 23 is not indefinite and the rejection should respectfully be withdrawn.

Claim 24 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 24 depends from claim 21. Claim 21 claims an optical head device. Thus claim 24 claims an optical head device. The claim 24 further limits an element (a hologram) of the optical head device of claim 21 and defines the nature of the hologram. Therefore claim 24 is not indefinite and the rejection should respectfully be withdrawn.

Claims 24 was rejected under 35 U.S.C. § 101 allegedly because the claimed invention was directed to non-statutory subject matter. Claim 24 has been amended to define the structure of the hologram. Therefore, the claimed invention is directed to a statutory subject matter. Thus, the rejection should respectfully be withdrawn.

Claims 1, 4, 6 and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by US 6,366,548 to Ohyama (hereinafter "Ohyama"). Amended claims 1 includes the limitation of "a diffraction grating which is provided on the optical path between said first light source and the objective lens and on the optical path between said second light source and the objective lens, and which has a first-order diffraction efficiency of almost zero for the light beam forwarded from said first light source and emits the first-order diffraction light for the light beam forwarded from said second light source, wherein the diffraction grating does not diffract returned light from a recording medium." Amended claims 6 includes the limitation of "a first diffraction grating which has a first-order diffraction efficiency of almost zero for the light beam forwarded from said first light source and emits the first-order diffraction light for the light beam forwarded from said second light source; and a second diffraction grating which emits the first-order diffraction light for the light beam forwarded from said first light source and has a first-order diffraction efficiency of almost zero for the light beam forwarded from said second light source; wherein the first and second diffraction gratings do not diffract returned light from a recording medium." Claim 4 depends from claim 1 and claim 9 depends from claim 6. The Office Action fails to show that Ohyama discloses the above limitations. Thus the rejection should be respectfully withdrawn at least because each of claims 1, 4, 6 and 9 includes at least one feature that Ohyama fails to disclose.

Claims 14 and 16 were rejected under 35 U.S.C. § 102(e) as being anticipated by US 6,072,579 to Funato (hereinafter "Funato"). Claims 14 and 16 have been canceled. Thus the rejection should be respectfully withdrawn.

Claims 18-19 were rejected under 35 U.S.C. § 102(e) as being anticipated by US 6,404,709 to Kouno (hereinafter "Kouno"). Claims 19 depends from claim 18. Thus claims 18 and 19 include the limitation of "the position of the optical axis of said objective lens is disposed at least between the optical axes of beams of said first and second light sources, and the optical axis of said objective lens coincides with the optical axis of the beam of light of a shorter wavelength, or disposed nearer to the position of the optical axis of the beam of light of a shorter wavelength than to the beam of light of a longer wavelength."

On the other hand, Kouno discloses "said optical axis coupling prism has a first light separating device, arranged between said second plane of incidence and said plane of synthesis, for generating two sub laser beams which are deviated from the optical axis of said second laser beam" (paragraph 9, lines 63-67, claim 1). That is, the first and second light beams must coincide with each other in Kouno.

Thus, the rejection should respectfully be withdrawn at least because the Office Action fails to show that Kuono discloses the limitation of "the position of the optical axis of said objective lens is disposed at least between the optical axes of beams of said first and second light sources, and the optical axis of said objective lens coincides with the optical axis of the beam of light of a shorter wavelength, or disposed nearer to the position of the optical axis of the beam of light of a shorter wavelength than to the beam of light of a longer wavelength."

Claims 21-22 and 25 were rejected under 35 U.S.C. § 102(e) as being anticipated by US 5,986,996 to Kitamura et al (hereinafter "Kitamura"). Claim 22 depends from claim 21. Thus claims 21-22 include the limitation of "the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram". Claim 25 includes the limitation of "the distance between said first and second light sources and said hologram is in the range from 20δ to 40δ " recited in claim 25.

On the other hand, in Fig. 16 of Kitamura it is not shown that the distance from the laser array 3 to the detector array 4 (left side) and distance from the laser array 3 to the detector array 4 (right side) are the same. The distance from the laser array 3 to the detector array 4 (left side) and distance from the laser array 3 to the detector array 4 (right side) will be different, because the left side light on left side is concentrated on the point of a path above

the detector array 4 (left side), but the right side light on right side is concentrated just on the detector array 4 (right side).

Therefore, the rejection should respectfully be withdrawn at least because the Office Action fails to show that Kitamura discloses the limitation of "the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram" or the limitation of "the distance between said first and second light sources and said hologram is in the range from 20 δ to 40 δ ".

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohyama in view of US 6,094,308 to Katsuma (hereinafter "Katsuma"). Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohyama in view of Katsuma in further view of US 6,414,930 to Shiono et al (hereinafter "Shiono"). Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohyama in view of US 5,541,909 to Nakajima et al (hereinafter "Nakajima"). Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohyama in view of Katsuma. Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohyama in view of Katsuma in further view of Shiono.

However, claims 2, 3 and 5 depend from claim 1 and claims 7 and 8 depend from claim 6. Thus each of claims 2, 3, 5, 7 and 8 includes the limitation of "a diffraction grating which is provided on the optical path between said first light source and the objective lens and on the optical path between said second light source and the objective lens, and which has a first-order diffraction efficiency of almost zero for the light beam forwarded from said first light source and emits the first-order diffraction light for the light beam forwarded from said second light source, wherein the diffraction grating does not diffract returned light from a recording medium" recited in claim 1 or the limitation of "a first diffraction grating which has a first-order diffraction efficiency of almost zero for the light beam forwarded from said first light source and emits the first-order diffraction light for the light beam forwarded from said second light source; and a second diffraction grating which emits the first-order diffraction light for the light beam forwarded from said first light source and has a first-order diffraction efficiency of almost zero for the light beam forwarded from said second light source; wherein the first diffraction grating and the second diffraction grating do not diffract returned light from a recording medium" recited in claim 6.

In Figs. 3, 4A and 4b of Ohyama, a first and a second diffraction gratings 13 and 14 are shown. However, those diffraction gratings 13 and 14 work for a light reflected and returned from the disc 10. Above diffraction gratings 13 and 14 should rather be compared

with the hologram 13 in our specification than be compared with diffraction gratings of claims 1 and 6. The diffraction gratings in claims 1 and 6 do not diffract returned light from the recording medium and are different from diffraction gratings 13 and 14 in Ohyama. Therefore, the rejections should respectfully be withdrawn at least because the Office Action fails to show that Ohyama and other references teach or suggest the above limitations.

Claims 10-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over US 6,211,511 to Shih et al (hereinafter "Shih") in view of Katsuma in further view of US 5,684,762 to Kubo (hereinafter "Kubo"). Claims 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Shih in view of Kubo in further view of US 5,687,153 to Komma et al (hereinafter "Komma"). Claims 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Shih in view of Kubo in further view of US 6,584,060 to Oohchida (hereinafter "Oohchida"). Claims 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Shih in view of Kubo in further view of Oohchida.

However, no motivation was shown to combine Shih and Kubo. The Office Action stated, "Kubo teaches that use of the nonpolarization beam splitter is preferable because a nonpolarization hologram can be mass-produced and is relatively inexpensive when compared to a polarizing beam splitter (Col. 9, lines 45-52)." (Page 14 of the Office Action). However, col. 9, lines 45-52 of Kubo's specification only states as follows:

"However, in the first and second embodiments of the present invention mentioned above, a PBS is not used, and instead thereof, a Wollaston prism 26 and a hologram plate 27 having transmission surfaces only are used. These can be mass-produced, and can perform multiple splitting of the beams. Therefore, the probability of a positional error of the optical elements in the first or second embodiment can be reduced because of the fewer number of the reflective surfaces. Hence, the servo signal is more stably produced, thereby leading to a higher yield apparatus. Moreover, since a relatively expensive PBS is not employed in the present invention, the manufacturing cost can be reduced."

This does not show the motivation to combine Shih and Kubo. Therefore, the rejections should respectfully be withdrawn at least because the Office Action fails to show the motivation to combine Shih and Kubo.

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Funato in view of Nakajima. Claim 17 has been canceled. Thus the rejection should respectfully be withdrawn.

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kouno in view of Nakajima. Claim 20 depends from claim 18 and includes the limitation of "the position of the optical axis of said objective lens is disposed at least between the optical axes of beams of said first and second light sources, and the optical axis of said objective lens coincides with the optical axis of the beam of light of a shorter wavelength, or disposed nearer to the position of the optical axis of the beam of light of a shorter wavelength than to the beam of light of a longer wavelength."

On the other hand, Kouno discloses "said optical axis coupling prism has a first light separating device, arranged between said second plane of incidence and said plane of synthesis, for generating two sub laser beams which are deviated from the optical axis of said second laser beam" (paragraph 9, lines 63-67, claim 1). That is, the first and second light beams must coincide with each other.

Thus, the rejection should respectfully be withdrawn at least because the Office Action fails to show that Kouno teaches or suggests the limitation of "the position of the optical axis of said objective lens is disposed at least between the optical axes of beams of said first and second light sources, and the optical axis of said objective lens coincides with the optical axis of the beam of light of a shorter wavelength, or disposed nearer to the position of the optical axis of the beam of light of a shorter wavelength than to the beam of light of a longer wavelength."

Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kitamura in view of US 5,243,585 to Hoshino et al (hereinafter "Hoshino"). Claim 24 depends from claim 21 and includes the limitation of "the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram."

However, in Fig. 16 of Kitamura, it is not shown that the distance from the laser array 3 to the detector array 4 (left side) and distance from the laser array 3 to the detector array 4 (right side) are the same. The distance from the laser array 3 to the detector array 4 (left side) and distance from the laser array 3 to the detector array 4 (right side) will be different, because the left side light on left side is concentrated on the point of a path above the detector array 4 (left side), but the right side light on right side is concentrated just on the detector array 4 (right side).

Thus the rejection should respectfully be withdrawn at least because the Office Action fails to show that Kitamura teaches or suggests the limitation of "the center of said hologram is aligned with the midpoint between the optical axis of said first light source and that of said second light source in projection on said hologram."

Claims 26 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kitamura in view of Kubo. However, no motivation to combine Kitamura and Kubo is shown. The Office Action stated, "Kubo teaches that use of the nonpolarization beam splitter is preferable because a nonpolarization hologram can be mass-produced and is relatively inexpensive when compared to a polarizing beam splitter (Col. 9, lines 45-52)." (Page 19 of the Office Action). However, col. 9, lines 45-52 of Kubo's specification only states as above and this does not show the motivation to combine Kitamura and Kubo. Therefore, the rejections should respectfully be withdrawn at least because the Office Action fails to show the motivation to combine Kitamura and Kubo.

Claim 33 was rejected under 35 U.S.C. § 103(a) as being unpatentable over US 6,385,158 to Takagi et al (hereinafter "Takagi") in view of Kitamura. Amended claim 33 includes the limitation of "a diffraction grating which is placed on the optical path between said first light source and the hologram and on the optical path between said second light source and the hologram and which produces almost 100% of the 0-order diffraction light for the light beam forwarded from said first light source and has a first-order diffraction efficiency of almost zero and emits the 0-order and first-order diffraction light for the light beam forwarded from said second light source." Neither Takagi nor Kitamura shows the limitation. In addition, the motivation to combine Takagi and Kitamura is not shown. Although the Office Action mentioned in col. 6, lines 37-44 of the specification of Kitamura, col. 6, lines 37-44 merely state as follows:

"A plurality of laser beam sources can be easily formed on the surface emitting laser array at low cost and high precision by a photolithographic technique, and the laser beam sources can be monolithically formed together with other circuit elements, photo diodes for detecting light, or photo transistors. For this reason, a compact and inexpensive optical pick-up can also be realized."

Thus the rejection should respectfully be withdrawn at least because the Office Action fails to show that the motivation to combine Takagi and Kitamura and because the Office Action fails to show that neither Takagi nor Kitamura discloses the limitation of "a diffraction

grating which is placed on the optical path between said first light source and the hologram and on the optical path between said second light source and the hologram and which produces almost 100% of the 0-order diffraction light for the light beam forwarded from said first light source and has a first-order diffraction efficiency of almost zero and emits the 0-order and first-order diffraction light for the light beam forwarded from said second light source."

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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